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Lawrence Berkeley National Laboratory
Scoping Study for HES Port to Java
Scope of Work

I. Introduction and Background

Under contract to the U.S. Department of Energy and U.S. Environmental Protection Agency, LBNL has developed a pair of web sites to help consumers improve the energy efficiency of their homes. The Home Energy Saver (HES) and the Home Energy Advisor (HEA) use similar energy models, default input data, and some overlapping content, but employ different user interfaces. During an earlier phase of this subcontract, the subcontractor ported the HEA to the Java programming environment. It is LBNL's intent in the future to port the unique HES functionality to Java, building on the Java code-base developed for HEA. In addition, the existing HEA Java code needs to be optimized for better performance and to allow easier incorporation of the new HES features. To allow for accurate planning and budgeting of these future phases, LBNL needs better information about the effort needed to implement these software changes. The subject of this SOW is to plan and estimate the cost for this porting and optimization work.

II. Tasks

1) Subcontractor will describe the steps needed to design and implement an optimized architecture for the Java-based HEA site, to improve performance and future expandability of the site. The optimized architecture will conform to accepted principles of Model-View-Controller architectures and object-oriented design. The subcontractor will estimate the effort and schedule that would be required to carry out the design and implementation of this new architecture. This optimized architecture should be designed in a way that allows for the addition of new features with a minimum of effort. Effort estimates should include documentation of the final software using JavaDocs and UML diagrams.

2) Based on a description of the current HES site provided by LBNL staff[1], subcontractor will estimate the effort and schedule to design and implement an architecture for adding functionality from the HES web site into the Java-based Home Energy Advisor modeling engine (assuming the optimizations identified in Task 1 were previously implemented). The architecture will include user interfaces for both HES and HEA that tie into the common back-end modeling engine. The cost to modify the current HEA user interface layer should be estimated separately. In addition, several optional features (that might be included in the scope for the "core" HES port, or proposed as follow-on work for the following year) will be described to the subcontractor, for preparation of separate cost estimates. Effort estimates should include documentation of the final software using JavaDocs and UML diagrams.

3) Working with LBNL staff, review LBNL's estimates of staff effort needed during the implementation phase of the HES port to Java. Identify assumptions in the LBNL effort estimates that are not consistent with the subcontractor's effort estimates from Tasks 1 and 2, with particular emphasis on identifying tasks that are missing from the LBNL estimates.

[1] And any additional features to be added while HES is being ported to Java.

III. Budget

Tasks 1-3 will be performed at an hourly rate of $62.50, for a level of effort not to exceed $10,000.00. Travel expenses (lodging and per diem costs incurred to extend the trip for the HEA port project) will be reimbursed at contractor's cost, up to $1000.00.

IV. Deliverables

Scoping report, documenting the results of Tasks 1-3. Draft to be delivered within 3 weeks of task start, with a final version incorporating LBNL's comments delivered 4 weeks after task start. The cost estimates for Tasks 1 and 2 should be broken down as follows:

1) Analysis and design of new site (optimized HEA + core HES features + "hooks" to accommodate future features)
2) Implementation of optimized HEA
3) Implementation of core HES features onto optimized HEA code base
4) Design and implementation of optional functionality

Where possible, costs should be broken out to the level of "functional feature" (e.g., HES input pages, lighting model, etc.). Also, tasks requiring major effort, or large uncertainties, should be identified in the report.